

August 27, 2020

2000-4535-59240-09

Kimberley Toews-Koch  
Senior Engineering Technologist  
TAQA North Ltd.  
2100, 308 – 4 Ave. SW  
Calgary, AB T2P 0H7

Dear Ms. Toews-Koch:

**RE: PRESSURE MAINTENANCE WATERFLOOD SPECIAL PROJECT – AMENDMENT #8  
OTHER THAN NORMAL SPACING ORDER – AMENDMENT #8  
BOUNDARY LAKE FIELD – BOUNDARY LAKE “A” POOL – PROJECT #1**

The Commission is presently reviewing and amending waterflood approvals to conform to current requirements. The continued operation of a pressure maintenance waterflood in the Boundary Lake field – Boundary Lake “A” pool Project #1 by TAQA North Ltd. requires this review.

The Boundary Lake - Boundary Lake ‘A’ pool Project #1 oil commenced production in September 1959. A pressure maintenance waterflood project was approved in August 1964, with injection starting in September 1964. Operated under several adjoining project approvals the Project #1 portion of this pool currently has 27 active producers and 9 injectors. A review of reservoir performance indicates that the waterflood was successful in stabilizing the GOR, achieving a cumulative oil recovery of approximately 55%.

The following Orders are attached;

- 1) Order 64-09-004 Amendment #8 designating Pressure Maintenance Waterflood within the Boundary Lake field – Boundary Lake “A” pool – Project #1, as a Special Project under section 75 of the *Oil and Gas Activities Act*, and
- 2) Order 64-09-004 Amendment #8 - OTN approving Other Than Normal Spacing under section 65.1 of the *Petroleum and Natural Gas Act* for the subject area and formation.

The Commission has identified that there are no reservoir pressure tests reported from project #1 since 2011. In order to determine the average current reservoir pressure, the Commission requires that pressure measurements are taken from three of the nine injectors by December 31, 2020. Future reservoir pressure requirements will be dependent on results.

This amended approval includes a maximum wellhead injection pressure (MWHIP), an ultimate pool pressure limit, and restriction of injection for the purpose of oil recovery.

Please note that, as per section 75 of the *Drilling and Production Regulation*, a record of the volume of water injected and the MWHIP must be reported via Petrinex not later than the 20<sup>th</sup> day of the month following the reported month.

Should you have any questions, please contact Petra Kriescher-Trudgeon at (250) 419-4415 or the undersigned at (250) 419-4430.

Sincerely,



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Ron Stefik, Eng.L.  
Supervisor, Reservoir Engineering  
Oil and Gas Commission

Attachments



## ORDER 64-09-004 Amendment #8

- 1 Under section 75(1)(a) of the *Oil and Gas Activities Act*, the Boundary Lake field – Boundary Lake “A” pool – Project #1 is designated as a Special Project for the recovery of oil utilizing pressure maintenance waterflood within the following area;  
Twp 85 Rge 14 W6M S/2 Section 22, Section 26, N/2 Section 34, and Section 35.  
Twp 86 Rge 14 W6M Section 2, S/2 Section 3, E/2 Section 11, and E/2 Section 14.
- 2 Under section 75(2) of the *Oil and Gas Activities Act*, I specify the following:
  - a) The project unadjusted daily oil allowable (UDO) is 782.1 m<sup>3</sup>/d
  - b) All associated produced gas must be conserved.
  - c) Water may be injected into the wells listed in Appendix ‘A’.
    - i. For wells injecting other than fresh water, inject only through tubing with a packer set as near as is practical above the injection interval.
    - ii. Not exceed an injection pressure, measured at the wellhead of 14,300 kPa or the pressure required to fracture the formation, whichever is lesser.
  - d) Not exceed an average pool pressure of 12,631 kPa measured at 533 meters subsea.
  - e) Cease injection into a well referenced in (c) and notify the Commission immediately if hydraulic isolation is lost in the wellbore or formation.
  - f) Submit reservoir pressure test results from three of the nine injectors by December 31, 2020.
  - g) Submit the annual packer isolation test report for wells referenced in (c) to the Commission within 30 days of the completion of the test.
  - h) Include the monthly injected volume, injection hours and the maximum injection pressure value for the wells referenced in (c) via Petrinex.
  - i) Injection must cease upon termination of production from the pool.
  - j) Annual pool VRR must not exceed 1.0

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Ron Stefik, Eng.L.  
Supervisor, Reservoir Engineering  
Oil and Gas Commission

DATED AT the City of Victoria, in the Province of British Columbia, this 27<sup>th</sup> day of August 2020.

**Advisory Guidance for Order 64-09-004 Amendment #8**

- I. A production packer must be set above the injection interval and the space between the tubing and casing filled with corrosion and frost inhibiting fluids, as per section 16(2) of the Drilling and Production Regulation.
- II. Annual packer isolation tests are required to be submitted, as per section 16(3) of the Drilling and Production Regulation.
- III. Injected fluids must be metered and the injection pressure measured at the wellhead, as per section 74 of the Drilling and Production Regulation.
- IV. A monthly disposal statement must be submitted to the Commission via Petrinex not later than the 20th day of the month following the reported month, as per section 75 of the Drilling and Production Regulation
- V. Seismic events must be reported and injection operations suspended as per section 21.1 of the Drilling and Production Regulation.

## Appendix A: Boundary Lake – Boundary Lake ‘A’ pool – Project #1 Water Injectors

<b>WA</b>	<b>Well Name</b>			<b>UWI</b>
465	TAQA NORTH	BOUNDARY	16-26-085-14	100162608514W600
574	TAQA NORTH	BOUNDARY	06-35-085-14	100063508514W600
575	TAQA NORTH	BOUNDARY	06-26-085-14	100062608514W600
605	TAQA NORTH	BOUNDARY	16-02-086-14	100160208614W600
1022	TAQA NORTH	BOUNDARY	16-34-085-14	100163408514W600
1440	TAQA NORTH	BOUNDARY	06-02-086-14	100060208614W600
1666	TAQA NORTH	BOUNDARY	02-03-086-14	100020308614W600
14103	TAQA NORTH	BOUNDARY	07-11-086-14	100071108614W600
14364	TAQA NORTH	BOUNDARY	05-22-085-14	100052208514W600



## ORDER 64-09-004 Amendment #8 - OTN

1 Under Section 65.1(2) of the *Petroleum and Natural Gas Act*, Other Than Normal Spacing is approved within the Boundary Lake field – Boundary Lake “A” pool – Project #1 within the following area;

Twp 85 Rge 14 W6M      S/2 Section 22, Section 26, N/2 Section 34, and Section 35.  
Twp 86 Rge 14 W6M      Section 2, S/2 Section 3, E/2 Section 11, and E/2 Section 14.

2 Under section 65.1(3) of the *Petroleum and Natural Gas Act*, I specify the following:

- a) the target area for an oil well completed within the project area is not nearer than 100 m to the sides of the Other Than Normal Spacing area,
- b) an oil well completed outside the target area specified in paragraph (a) may be subject to an off-target production penalty,
- c) oil wells drilled within the specified project area are not subject to spacing requirements.

A handwritten signature in blue ink, appearing to read 'R Stefik'.

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Ron Stefik, Eng.L.  
Supervisor, Reservoir Engineering  
Oil and Gas Commission

DATED AT the City of Victoria, in the Province of British Columbia, this 27<sup>th</sup> day of August 2020.